

HALAL CHECKER APPS

By

Lobna Shahirah binti Mohd Sabirin

15971

Dissertation report submitted in partial fulfilment of
the requirements for the
Bachelor of Technology(Hons)
(Information Communication Technology)

MAY 2015

Universiti Teknologi PETRONAS
32610 Bandar Seri Iskandar
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

HALAL CHECKER APPS

By

Lobna Shahirah binti Mohd Sabirin

15971

Dissertation report submitted to the
Information Communication Technology Programme
Universiti Teknologi PETRONAS

In partial fulfilment of the requirements for the
BACHELOR OF TECHNOLOGY(HONS)
(INFORMATION COMMUNICATION TECHNOLOGY)

Approved By,

(Ms. Aliza Bt Sarlan)

UNIVERSITI TEKNOLOGI PETRONAS

BANDAR SERI ISKANDAR, PERAK

May 2015

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that original work contained herein have not been undertaken or done by unspecified sources or persons.

LOBNA SHAHIRAH BINTI MOHD SABIRIN

ABSTRACT

Lack of awareness among Muslim consumers, unreliable database, and difficulties to check Halal status due to uncertainties is the obvious problems happened in consumers' life. Therefore, this paper discussed about Halal Checker Apps which is to check the status of the food products available on the market today. It is hoped that this paper will give an awareness and better understanding towards Muslim consumers about the Halal status and the importance of consuming a good food. The research is focus on JAKIM which provide the information about the Halal product certification, food product produced by manufacturer and ingredients of the food products. Besides, this application will be delivered to Muslim community in order for them to shop the Halal products. The exploratory study is conducted to collect the data as much as possible from the consumers. The qualitative and quantitative methods are utilized to ensure the problems regarding Muslim consumers are addressed to the project solution. The results from the survey and interview are hoped that will give a way for the problem to be solved. Though this paper does not cover all problems involved Halal status, it is nevertheless important as it will create confidence among Muslim consumers in buying Halal food products. It is recommended to practice a good consumer habit as it is pertaining to the obligations of the religion which highly emphasized on the food that all Muslims consumed.

ACKNOWLEDGMENT

I would like to take this opportunity to thank all parties involved in this Final Year Project I and II that lead the course to success. I honourably thanking Computer and Information Sciences Department at Universiti Teknologi PETRONAS (UTP) for providing the opportunity to learn and experience the real project research and also for all their support, help, and advice which played an essential role in the success of this project. I would like to thank the following person for their professionalism and contributing to the project.

- Ms. Aliza Bt. Sarlan (Supervisor of FYP)
- Assoc. Prof. Dr W. Fatimah W. Ahmad (Co-Supervisor of FYP)
- Dr Ahmad Sobri Bin Hashim (Coordinator of FYP)
- Mohamad Romzi Sulaiman (Senior Manager Global Halal Support Centre)
- Dhaliff G. Anuar (Trainer & Consultant Halal Integrity)

I would like to express my appreciation to lecturers and UTP staffs which have spent their precious time to provide additional support and advice throughout the Final Year Project I and since the starting of my learning in UTP especially the Computer Information and Science Department Lecturers.

Last but not least to all my fellow friends and my family who have always giving me courage and advice throughout this course in order to complete my Final Year Project.

TABLE OF CONTENTS

CERTIFICATION OF APPROVAL	i
ABSTRACT	ii
ACKNOWLEDGEMENT	iii
INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement.....	3
1.3 Objectives of Study	4
1.4 Scope of Study.....	5
LITERATURE REVIEW.....	6
2.1 Current Technologies in the Market.....	10
2.2 How Halal Checker Apps is different from other technologies?	11
2.3 The important criteria that Halal Checker Apps need to have	12
2.4 Gaps found in the literature and way forward	14
METHODOLOGY	15
3.1 Introduction	15
3.2 Survey	17
3.3 Interview.....	18
3.4 Development Methodology	18
RESULTS AND DISCUSSION	21
4.1 Data Gathering and Analysis.....	21
4.2 Reflection	31
CONCLUSION AND RECOMMENDATION	38
5.1 Conclusion.....	38
5.2 Recommendations	39

REFERENCES.....	40
APPENDICES	43

LIST OF FIGURES

Figure 3.1.1 Application Development

Figure 3.1.2 Gantt Chart and Key Milestone Final Year Project 1

Figure 3.1.3 Gantt Chart and Key Milestone Final Year Project 2

Figure 3.4.1 Agile Development Methodology

Figure 3.4.1 System Architecture

Figure 4.1.1.1 Gender of respondents

Figure 4.1.1.2 Age of respondents

Figure 4.1.1.3 Occupation of respondents

Figure 4.1.1.4 Smartphone user among respondents

Figure 4.1.1.5 Operating system of smartphone

Figure 4.1.1.6 Rate on mobile apps utilization

Figure 4.1.1.7 Islamic apps utilization

Figure 4.1.1.8 Rate on spending for shopping food products

Figure 4.1.1.9 Rate on Halal status check by consumers

Figure 4.1.1.10 Rate on consumers' concern on Halal logo and ingredients of products

Figure 4.1.1.11 Rate on doubtness of consumers on certain products

Figure 4.1.1.12 The choice of consumers when shopping food products

Figure 4.1.1.13 The importance of apps assistance to check Halal status

Figure 4.1.1.14 The awareness of consumers on Halal issues

Figure 4.2.1 Activity Diagram on entering barcode

Figure 4.2.2 Activity Diagram on selecting additives

Figure 4.2.3 Activity Diagram on selecting manufacturer name

Figure 4.2.4 Use Case Diagram

Figure 4.2.5 Halal Checker Apps interfaces

Figure 4.2.6 Functionality Testing

Figure 4.2.7 User Acceptance Testing

Figure 4.2.8 Student's Feedback on Halal Checker Apps

Figure 4.2.9 Student's Feedback on Halal Checker Apps

LIST OF TABLES

Table 2.2.1 Comparative study on the Mobile Apps features

Table 2.3.8 Criteria that best represent a Halal Checker apps

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Halal in Quranic term means lawful, permitted and allowed (Khalek, 2014). As a Muslim that populated the world over 1.6 billion, everyone are obligated to consume Halal food in everyday life (Yunus, Rashid, Ariffin, & Rashid, 2014). Indeed, all Muslims have the right to choose the pure and quality food because of the positive health benefits. Furthermore, Muslim need to prevent from taking food that is shoobhah or mashbooh which simply means questionable and suspected. In Quran, Allah has said in verse 2:172, *“O who you have believed, eat from pure things which we have provided you”* (Importance of Halal, n.d.). This order was explained to humankind for taking a good food that is available in this world. Moreover, food that people consumed will shows our good behaviour if it is good and vice versa.

Furthermore, from His command, Muslims believed that whoever consumed a good food, her or his dua will be accepted by Allah and whoever consumed non-Halal food will be sentenced in hereafter even in this world. Surely, that is the greatest loss ever to people that are careless about food consuming. In addition, this command is confirmed by the following tradition which is from Jabir RA reported from, Allah’s Messenger PBUH said, *“That flesh will not enter Paradise which has grown from Haram, and all that flesh which has grown from Haram, the fire(of hell) is more worthy of it.”* (Ahmed, Darimi, Baihaqi, 2015).

That is why Allah really take this issue seriously among Muslim in this society to be more responsible on what they are doing in their life as this world become more tougher as many food being manufactured by non-Muslim factory as well as imported food coming to Malaysia which is majority, Islam community.

The food is categorized as Halal if it does not harm or interfere with the normal functioning of the body and mind. Next, it is free of najis (filth) and of products derived from carrion or from dead animals that have been properly slaughtered or hunted. The products also free from pigs or dogs or other Haram animals (Consumers Association of Penang, 2006).

This application will be developed on Android platform as Android is an open source for the user. According to the research, half of mobile user found the last app they downloaded via app store search which stated 53% Android users did the same on Google Play (Perez, 2014). Research in Information Retrieval (IR) has proposed a technique of query expansion. However, this technique is still produced poor result when applied to Halal food checker. Hence, I believe that the reason for the above is the choice of techniques need to suit the context in which the consumers will be more aware about the Halal products.

As such, this project will develop an application for consumer which provide the awareness of the available Halal products in the market. By doing this, the application will be more useful for consumers to make a proper decision while shopping. Besides, this project will be developed to help The Malaysian Islamic Development Department or JAKIM to be more responsible in monitoring the products that have been manufactured in order to get the Halal certificate. Furthermore, this project will be more helpful to provide information that sometime not existed in the database in an efficient way to the consumers. Research in database security is needed in order to develop the application for consumers.

Awareness might be defined differently by different people. In this project, awareness means having knowledge or perception about something or situation or fact. While for the next problem statement, unreliable simply means untrustworthy, undependable, uncertain and inaccurate. As for last problem statement, difficulties in this context is hard, complex and confusing.

The rest of this chapter will be organized as follows, the next section will put forward the problem statement of the project. This will be followed by the objectives and scope of this project.

1.2 Problem Statement

1.2.1 Lack of awareness among Muslim consumers

There is a problem of lack of awareness among Muslim society about the Halal food in the market (Ambali & Bakar, 2014). Despite the Halal certification on the products, the problem of lack of awareness on the ingredients used to manufacture the products is still shown by the Muslim consumer. This has been reported by many researchers such as consumers tend to buy the products by choosing the brand first and sometime the product have issue on the ingredients or as they frequently used the products instead of aware about the product available now that are being manufactured by Halal gelatin or any other Halal ingredients.

This problem has negatively impacted Muslim consumers because this will lead to the consuming Haram products in everyday life. A possible cause of this problem is the lack of promotion from JAKIM about Halal gelatin based food product available on the market. Thus a study which investigates the lack of awareness among Muslim consumers by implementing the Information Retrieval technique could remedy the situation.

1.2.2 Unreliable Database

Other than that, the problem of unreliable database from JAKIM about Halal products has been arisen among society (Bernama, 2015). Despite the Halal certification in the database, there are still doubt about the product as issue arisen about the ingredients of the products. This has been faced by Muslim consumer about cadbury issue that was recently has been uproar about one of the ingredients may be harmful. As this issue arisen, it impacted consumer negatively as consumer will never buy the cadbury again as confusion happened among JAKIM and Ministry of Health of DNA's result of cadbury.

A possible cause of this problem is the lack of monitoring of the products being manufactured as well as irresponsible of JAKIM to give Halal certification without knowing the status of the ingredients of the products. Thus a study to investigate the

unreliable database by implementing the database security technique which implied the availability could remedy the situation.

1.2.3 Difficulties to check Halal status due to uncertainties

Besides, a difficulties to check the Halal status of the specific product also one of the doubtful situation that arised the problem (Bernama, 2015). People are living in doubts and uncertainties about the Halal logo on the products as this sign is misused by the business. This has been reported by consumers which SMS provider does not showing any information either the product is Halal or not. In addition, current application available on mobile apps does not updated with the JAKIM database.

This case may cause the consumers' dissatisfaction and lead them to shop non-Halal food. The lack of proper legislation on this issue and poor enforcement of the law is a possible cause of this problem. Thus a study to investigate the difficulties to check the Halal status is by implementing the database security technique which implied the integrity and security could remedy the situation.

1.3 Objectives of Study

The aim of this project is to develop an application on Android for implementing Halal checker to know the status of the food which implements an awareness to the consumers. In order to fulfill the aim, the following objectives have been constructed such as to investigate on Halal program by JAKIM, to design and develop Halal apps and fulfil the requirement on the unit testing, integration testing, system testing and acceptance testing, and last but not least is to study on information retrieval from barcode.

1.3.1 To Investigate on Halal Program by JAKIM

For the first objectives, research on how JAKIM works on giving Halal certificate to the products and promote the Halal products to all Muslim in this country are being conducted.

1.3.2 To Design and Develop the Application for Halal Checker

Next objective is to achieve the aim which to develop the application that can assist the consumer to shop the Halal products. This application will be developed using Apps Inventor. This also including the testing on the application in order it met the requirements stated in this reasearch paper.

1.3.3 To do a Reasearch on Information Retrieval

Last but not least, a research on how the information retrieval works from database and being delivered to the consumers is being conducted. This study aims at producing a method for detecting ingredients in food products using barcode. Furthermore, this application will be developed to retrieve the information from the database and ensure the right information is being delivered.

1.4 Scope of Study

The scope of this study is JAKIM which provide the information about the Halal product certification, food monitoring during manufactured and Halal ingredients in the products. Kementerian Perdagangan Dalam Negeri Dan Kepenggunaan(KPNKK) also responsible to act as middlemen between consumers and manufacturers who will solve the problem about products in Malaysia reported by consumers. Besides, this application will be delivered to Muslim community in order for them to shop the Halal products.

CHAPTER 2

LITERATURE REVIEW

Based on the problem stated in this paper which is lack of awareness among Muslim consumers, unreliable database from JAKIM, and difficulties to check the Halal status due to uncertainties, therefore it is a need to have Halal Checker to help Muslim consumers to shop Halal products available in the market today. By developing this application, consumers can increase their awareness about the Halal issues and status of specific products. The responsibility of JAKIM to update the database which consumers can rely on should be improved as they can monitor the report from this application about specific products that can be inspect to check the real status of the products. Furthermore, consumers can choose the products wisely in an effective and efficient way as this application is easy to use as it give faster result to track the products status. Hence, the research on mobile apps and Halal industry are being done. Next, the techniques used to check the Halal status of the product which focus on Information Retrieval (IR) has been investigated.

Mobile Apps has been developed on smartphone through various platform such as Apple Ios and Android which shows the brand identity. It can be recognized through the name of the application or brand logo or icon (Bellman, Potter, Treleaven-Hassard, Robinson, & Varan, 2011). According to the Bellman et al. (2011), the interest among marketers have been rising as mobile applications being developed which primarily because of the user engagement toward the brand increase. Moreover, the interactivity plays an essential role in mobile apps which resulted in purchasing towards the mobile apps brand.

In other research, 47% people found the app through the App Store's search engine on iOS, while 53% of Android users did the same on Google Play (Perez, 2014). According to the previous study, users are less likely to download the applications that are seem not important or less usability for them. In other words, users are more likely to download an application that are beneficial for them and keep their interest

for a longer time. For the side of developers, they focusing on becoming top 25 in the search ranking as apps stores continue to expand in the market.

Further research by Perez (2014), advertisement plays an essential role on Facebook and Twitter as they contribute search percentage of new app to people. 10% of users downloaded an iOS app because they saw in on the charts, and only 2% said they did so because Apple featured it on the store. On Android, those numbers are 9% and 6% respectively. As research on mobile apps has been done, the Halal food industry in Malaysia is being investigated to relate and elaborate to the problem statement.

According to Said, Hassan, Musa, & Rahman (2014), there are 16 millions of Muslim consumers ages around 15-64 years old have money to spend on Halal food. Based on the statistics in the year of 2008, the halal global market is reported to be worth USD580 billion. Hence, Halal products have a huge market not only in Malaysia but also in overseas especially in West Asia (Ariff, 2015). He also added on his research that high demand for halal products prompted many entrepreneurs including non-Muslims to vie for the Malaysian halal certification.

The problem appeared when there is a lacking on the Halal knowledge, information and education by the government agencies. The small and medium scale entrepreneurs may face problems in obtaining the halal certification that is currently issued by Jakim or the State Islamic Religious Departments (JAIN) as they may not have the GMP (Good Manufacturing Practice) and Hazard Analysis and Critical Control Points (HACCP) that may have failed to meet the conditions on cleanliness. A report said that producers who have big producing plants and utilise machineries have no problem in obtaining the certificate. JAKIM also recognized around 15% from 300 bodies globally offering the Halal certification. The Malaysian Halal certification, is among others based on the standards for halal food covering Production, Preparation, Handling and Storage - General Guide Line (MS15000).

Moreover, Halal foods have been demanded also by non-Muslim as Halal foods maintained the cleanliness and taste during the production. Furthermore, Muslim consumers always wondering either the food produced are Halal or otherwise as food products are being produced and originated from all parts of the world including non-Muslim countries.

Awareness and concern about the integrity of Halal logo and all activities along the supply chain have been a worrisome to Muslim consumers (Zulfakar, Anuar, & Talib, 2014). A report has proved that Muslim may just take for granted the halal wording or the logo without checking further while some may just buy the products as long as they are confident with the brand name (Ariff, 2015). Zulfakar et al. (2014) concludes that Malaysia is still lacking in meeting the Halal standardization that cause many Halal standards resulted from many agencies and Halal authorities. Therefore, this cause a question among the Muslim consumers as they may be sensitive to the halal aspect in what they consume and use.

Awareness about the Halal food started to grow as many food products are being produced that resulted a needed in information about the products that consumers would like to purchase. For the side of Jakim, they argues that they takes seriously each complaint and will act on it within 24 hours after the complaint is received and the e-mails will be replied within three working days after they have been forwarded to Jakim's public relations officer. They also provides the HALAL MALAYSIA status checking through SMS. In addition, they provide information on the Malaysian and foreign certification, Halal search facility based on barcode, product description or the name of the company that manufactured the products, listed hotels with Halal certification, glossary, food additives and others on Portal Halal Malaysia www.halal.gov.my to give an awareness to the Muslim consumers (Ariff, 2015).

A study conducted by Halim et al. (2014), Halal logo are being abused by irresponsible person or business that only want to gain profit especially in food products that cause Muslim consumers rights not fully protected under the law. A report from Bernama (2014) shows that a noodle factory in Seberang Prai has been penalised under Trade Description Act 2011 for using fake Halal logo which has not been authorized by JAKIM. The further investigation shows that the factory has been operated for the past 15 years and has beared a fake Halal logo along the years. The Malaysian Consumers Protection and Welfare Board (LPKPM) claims about 50 companies are using Halal logo not sanctioned by JAKIM (The Rakyat Post, 2015).

LPKPM president urged JAKIM to take action against the companies as they received six complaints regarding the issue.

Furthermore, rice noodles factory in Jalan Ipoh which bearing the mosque label has never been issued with Halal certificate by JAKIM, indeed they are using their own logo. Moreover, JAKIM has been prompted by pictures of dirty preparations of brand rice noodle at the factory (Bernama, 2014). Further report on a syndicate which using the name of “Datuk” to gain the trust of Halal applicants has been selling the fake Halal certificate from small to medium industries without JAKIM’s approval (Hussain, 2014). The syndicate has making money more than RM100,000 in each programme by collecting the participation fees ranging from RM250 to RM600 in the seminar.

In the nutshell, the research has shown that Muslim consumers are still lack of awareness in Halal products which flooded in the market. Halal industry also need an improvement in term of Halal logo, Halal standardization, Halal manufacturing as well as Halal awareness among consumers in order to ensure the traceability of the Halal supply chain. Moreover, this application indeed provide a way for consumers to solve their daily problems. Next, the information retrieval (IR) is being investigated to further fathom the research.

One prominent educator recently said that, “Information Retrieval (IR) consists of a document collection, a user query, a retrieval engine, and a ranking module (Al-Arab, Gadallah, & Hefny, 2014). As Mitra (n.d.) argues, the final documents that most satisfying the users’ need. The type of information retrieved should include text, images or graphics, speech, video and so on. However, text is most commonly used for the information retrieval. (Gossen & Nürnberger, 2013) concludes that, the existing search engines have a low significant in terms of their design and usability. Developer needs to investigate the user background which focus on the age, knowledge and abilities, and behaviour of the user in order to make the search engine more usable.

A study shows that by limiting the certain fields, search terms truncated, the search refined and search terms combined to form different kinds of search queries make the search more precise and get more useful results. In addition, different databases have

different kind of search options. Hence, it is better to check what kinds of search techniques the database supports before the search begins (University of Tampere, 2011).

There are many types of searching such as basic search, advanced search, mind map and Boolean search. In basic search, the search is directed by default to certain fields in the records that have entered into the database such as free text search. Furthermore, the search words do not have to be in one language only, if the search is conducted in database that has material in different languages. Free text search may often retrieve plenty of irrelevant results. The larger the database and the more extensive the topic of the search, the more difficult it is to achieve relevant search results with free text search.

For advanced search, it includes other limiters and features for more complex searches which will help to refine the search. Next, Boolean search such as AND, OR and NOT is an integral part of information retrieval, since it enables the user to construct logical relationships between search terms. Controlled vocabularies are an excellent aid in finding search terms and keywords. It provides related term and synonyms that have been used in entering information in databases.

In the nutshell, refinement of the keywords, limiters used in a search, and the chosen database can significantly alter the search results. The use of only one database does not necessarily offer sufficient results and therefore data must often be searched from several other information sources. When you have defined and specified your topic and chosen the keywords and possible limiters, you may begin the search in database (University of Tampere, 2011).

2.1 Current Technologies in the Market

There are many applications developed on mobile phone nowadays is to check the Halal status of the products, for example Halal e-codes (Pixzr, 2010), Halal Check (Farahnak, 2015), Scan Halal (ummah labs, 2015) and Just Halal (smart&geek, 2015). For the first application, Halal e-codes, it is only give the information about

the ingredients of the products and has been developed on Android for free use. Next, Halal Check is another extend to the Halal e-codes which it provides the Halal product sharing towards other consumers.

Scan Halal is using barcode scanner and barcode key-in to check the status of the products. It also give an information about the ingredients of the products as well as sharing to the other medium. Last but not least, Just Halal application is only function as a scanner to only check the status of food products. Below is the figure to summarize the current applications on mobile device.

Table 2.2.1: Comparative study on the Mobile Apps features

Type of Mobile Apps/Mobile Apps features	Halal e-codes	Halal Check	Scan Halal	Just Halal
Awareness towards Halal products	/	/		/
Information about food ingredients number	/	/	/	
Barcode reader			/	/
Barcode key in			/	
Select Manufacturer	x	x	x	x
Halal product sharing		/		
Report button	x	x	x	x
Android platform	/	/	/	/
IOS platform	x	x	x	x
Free	/	/	/	/

2.2 How Halal Checker Apps is different from other technologies?

Halal Checker Apps is different from other technologies as this application contains the features needed for Muslim consumers to gain information about Halal foods products. Halal Checker Apps is developed on mobile platform which is very

effective for the consumers to bring anywhere every time they want to purchase food products.

The purpose of this project is to identify gaps and discrepancies in the literature and to develop alternative research projects. Based on the technology comparative study, Halal Checker will be developed based on the features available on the current technologies today. Firstly, Halal Checker will give an awareness to the people about Halal products. Next, information about food ingredients will be make available in this application.

Furthermore, there is barcode reader to help scan the barcode on the product which will link to the database by JAKIM to check the status of the products. Barcode key in also one alternative for consumers to type the code and help retrieve the information. Next, Select Manufacturer is another alternative for consumers to check the validity of Halal certificates of each manufacturers in Malaysia and also the products being manufactured by manufacturer. Consumers also can share the information about the products to other people through e-mail, Facebook, Twitter and so on. This application will be developed on Android platform as it is available for everyone. Last but not least, Halal Checker app will be free to use by consumers who downloaded it on Android.

2.3 The important criteria that Halal Checker Apps need to have

The purpose of the study on the important criteria is to demonstrate relationships among prior research and to inform reader what has already been discovered to avoid duplication. Below is the summary of features of the mobile application and the table to summarize the features and previous works.

2.3.1 Scanner

Halal Checker app needs scanner to scan the barcode of the product. This scanner will capture the image of barcode and retrieve the status and information about the products (Google Play, 2015).

2.3.2 Barcode Key in

TextBox is used for consumers to key in the barcode of the specific products. This is another alternative developed to ensure the right information being retrieved by the database (Google Play, 2015).

2.3.3 Select Manufacturer

ListPicker is used for consumers to select manufacturer name in Malaysia. This is another alternative developed to ensure the right information being retrieved by the database (Google Play, 2015).

2.3.4 Share button

Another feature needed for Halal Checker apps is share button which will be developed for sharing information between consumers throughout many platform such as Facebook, Twitter or E-mail (Google Play, 2015).

2.3.5 Additives tab

Another advantage of this apps is contain additives tab which to focus on the specific ingredients of the products. The consumers can manage this additives tab by using favorite button to which ingredients they are concern about (Google Play, 2015).

2.3.6 Report Button

Report button is function as for consumers to report to KPDNKK regarding any issues on the products that are doubtful in the market today. This criteria is best when it sending the information to KPDNKK efficiently.

2.3.7 Home

Home button is make available for people to go directly to homepage interface. (Google Play, 2015).

Table 2.3.8: Criteria that best represent a Halal Checker apps

No	Mobile Application features	Previous works
1	Scanner	[3],[4]
2	Barcode Key in	[3]
3	Select Manufacturer	
4	Share button	[2]
5	Additives tab	[1],[2],[3]
6	Report button	
7	Home	

2.4 Gaps found in the literature and way forward

Although many applications developed today is to help consumers to check the Halal status, however, it is nevertheless not updated with the current database and increase the doubtful situation among consumers. Therefore, it is indeed significant to provide an alternative ways to accompany consumers to shop the Halal products using current technologies. Thus, this project is going to embed information retrieval technique to get the information from the database. The development of this mobile application hence will increase the awareness among consumers and reduce the doubt among them. Hence, the cleanliness of the body, mind and soul literally depends on the cleanliness of the food consumed. Next, the methodology for this research and development phase will be described to give the deeper understanding to the consumer about the applications and Halal industry.

CHAPTER 3

METHODOLOGY

3.1 Introduction

The objective of the research is to collect as much as information regarding the problem happened in Muslim consumers. In this section, the research methodology that will be used for the project is being described. The research methodology includes two types of method which are quantitative and qualitative. For quantitative, questionnaire or survey technique is being used to collect the data meanwhile for qualitative, group interview is used to provide more information regarding this project.

For the first phase, the survey and interview questions were prepared to conduct the study. The survey will effectively provide more respondents who consume the food products everyday. Furthermore, the interview thus was organized as an informal way but lead to the broader and deeper discussion about the reasearch. Besides, this interview can provide the accurate information and less expensive. Hence, semi-structured interview was conducted at Halal Development Centre (HDC) in First Avenue,Petaling Jaya. The interview was conducted successfully since the respondents are really cooperate to share the knowledge on Halal products.

For the development phase, the design and developing the application will be done to produce the design application and prototype. Last but not least, to assess the user acceptance on the application, the acceptance testing will be done. Beforehand, unit testing, integration testing and system testing will be conducted. Below is the figure to summarize the activities done.

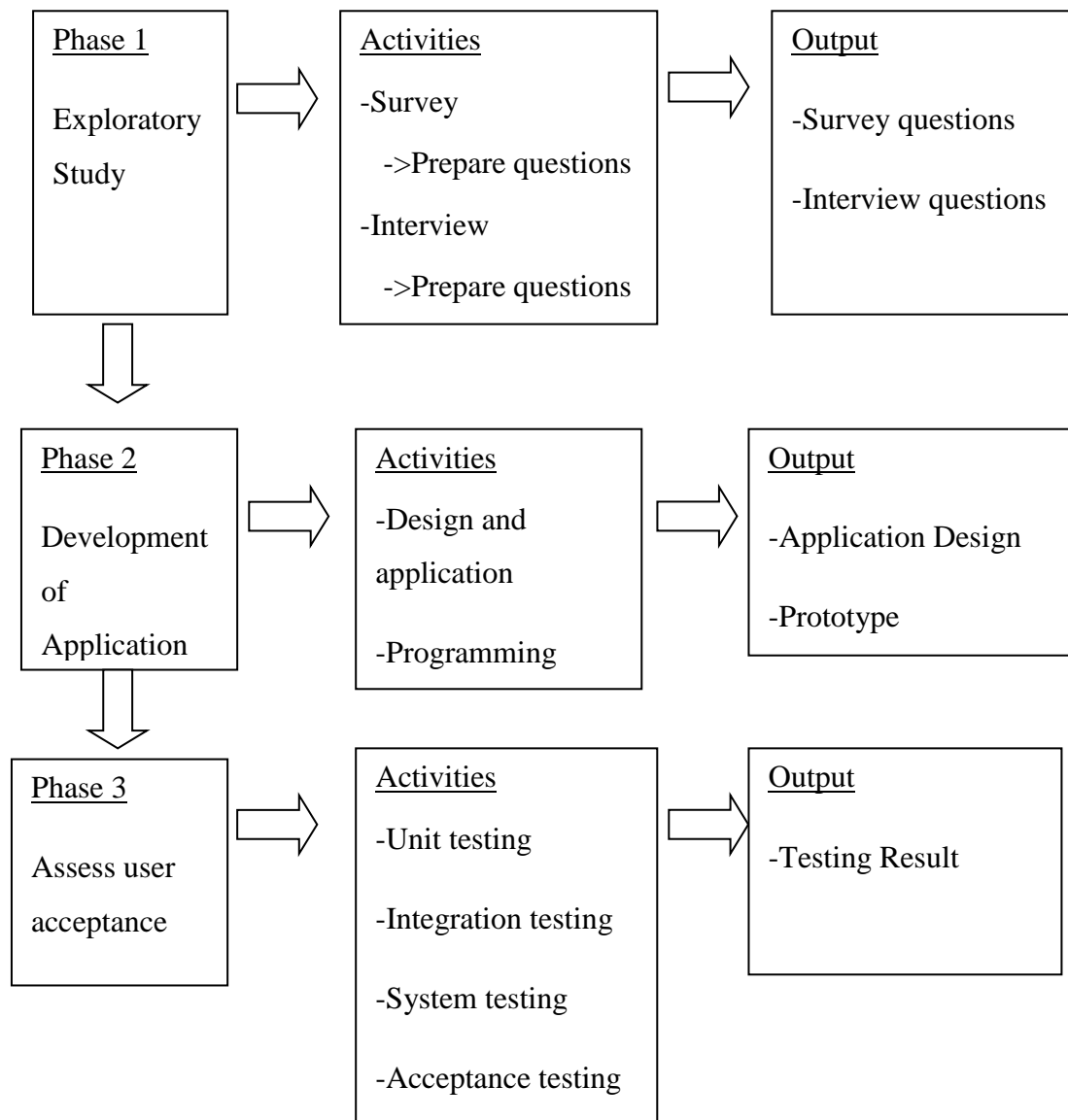


Figure 3.1.1 Application Development

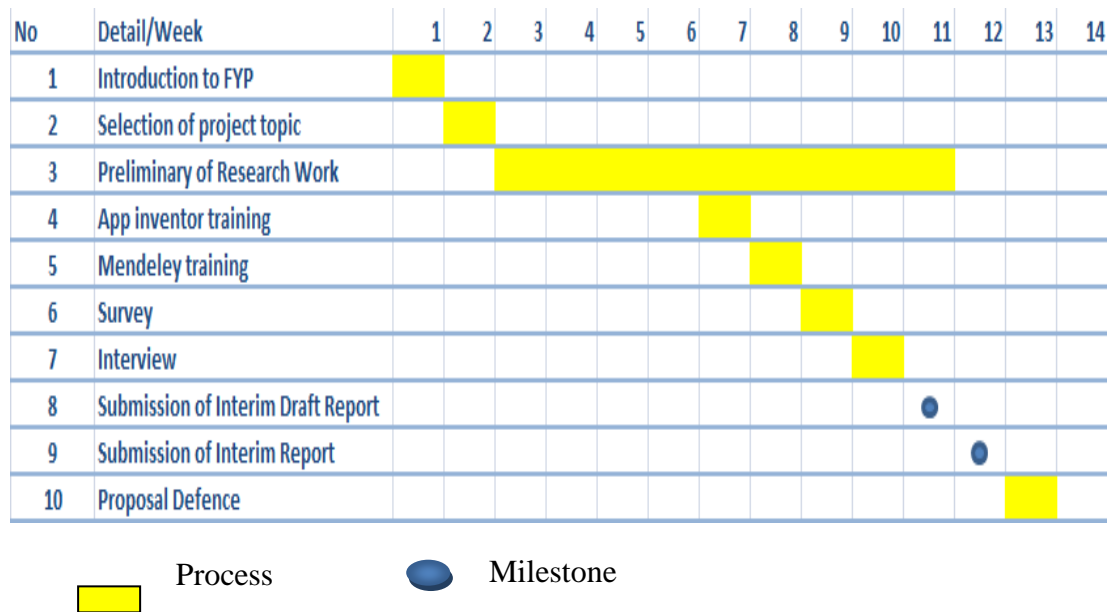


Figure 3.1.2 Gantt Chart and Key Milestone Final Year Project 1

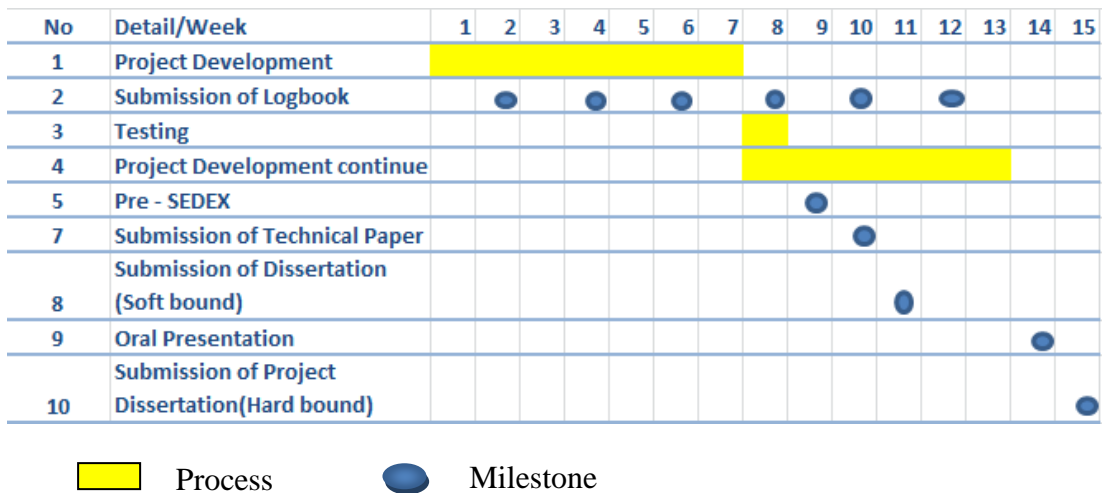


Figure 3.1.3 Gantt Chart and Key Milestone Final Year Project 2

3.2 Survey

For quantitative methodology, questionnaire or survey have been distributed throughout the Google Form among Muslim consumers. The survey has been distributed on Facebook, Twitter and any other technology to collect more respondents. The materials used in this research are Google Form to distribute the questionnaire, spreadsheet to record the data by questionnaire. The questions are attached at the appendices.

3.3 Interview

For qualitative part, group interview schedule was planned, having the questions prepared that are giving interviewee to voice out their knowledge, opinions as well as guidance on Halal industry. Interviewee are the Senior Manager of Global Halal Support Centre and Trainer & Consultant of Halal Integrity. The interview is done at First Avenue, Petaling Jaya. The materials used in this research are camera to capture the Halal products and book to record the interview data. The interview letter, the Halal products and interview questions are attached at the appendices.

After gathering all the information from all sources, survey or questionnaire and group interview, the data collected was analyzed. For example, from group interview, the data analyzed by looking at the individual's opinion and knowledge regarding Halal products in industry. Besides, the interaction between group members also can be analyzed to provide the distinctive form analysis. The materials used to analyze the data are bar chart or pie chart. The measurement to plot the data in the graph varied among the data collected. Thus the analyzed data will be used to draw the appropriate conclusion.

3.4 Development Methodology

For the development methodology, Agile Development is being used. Agile is an iterative development methodology. It is a better way to manage the software project rather than traditional approach. There are 8 principles of Agile to be hold in this project such as active user involvement, empowered to make decision, evolving in requirements but in the fixed timescale, high-level requirements is captured, small software developing, released incremental and process iteration, each features is completed before moving on to the next, integrated testing throughout the development phase and last but not least a collaborative and cooperative approach

between all stakeholders is essential (Waters, 2007). Furthermore, testing activity is based on unit testing, integration testing, system testing and acceptance testing. Therefore, the code is prepared to be tested as a unit testing, the combination of features and interaction between functionalities to be tested as integration testing, the testing of whole system and last but not least, the whole application to be tested between users in acceptance testing. The testing will be done after each development phase is done to avoid the defects on the application later. Below is the summarization of the development methodology.

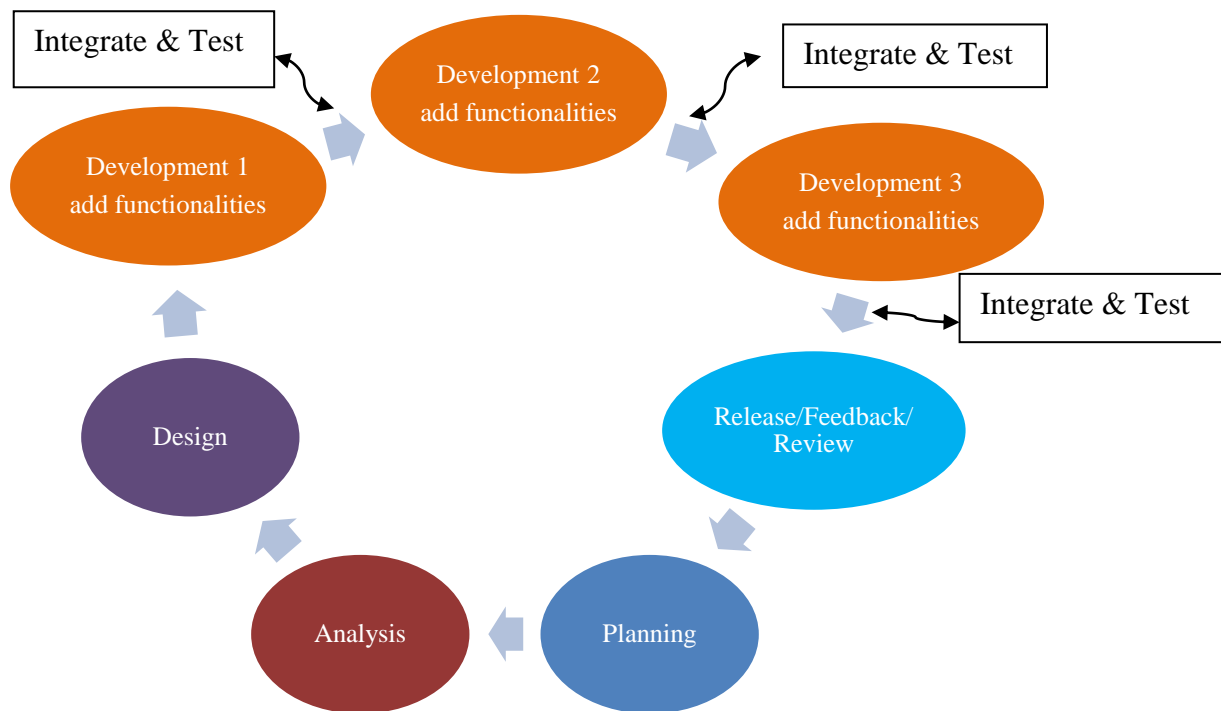


Figure 3.4.1 Agile Development Methodology

Halal Checker Apps will be developed using MIT App Inventor 2. App Inventor is suitable for a new developer as it is easy to learn and use. There are many tutorials on Youtube for developer to learn more about the code. Plus, the time constraint for developing the app is also a reason why developer choose the App Inventor to develop the Halal Checker Apps. The figure below shows the system architecture of Halal Checker Apps. In the data layer, the barcode entered by consumers will be stored in the database. There will be two API in the API layer which are private API for developer and public API for consumers. The database entered by consumers will be compared in the database in filtering request layer and last but not least it will shows the result in the presentation layer which is on Halal Checker Apps that works on Android.

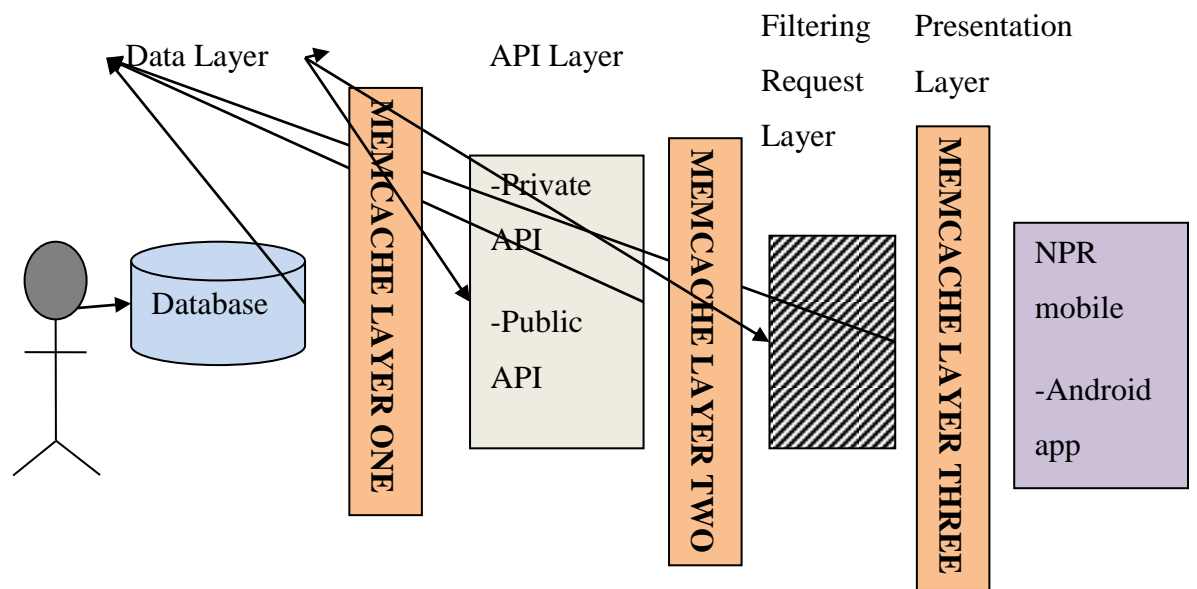


Figure 3.4.2 System Architecture

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Data Gathering and Analysis

After define the methodology, the survey and interview were conducted. Hence, the data collected from the survey were analyzed to draw the solution to the problem.

4.1.1 Survey

The survey question were distributed from 11 March 2015 until 16 March 2015. Below are the figures represent the results.

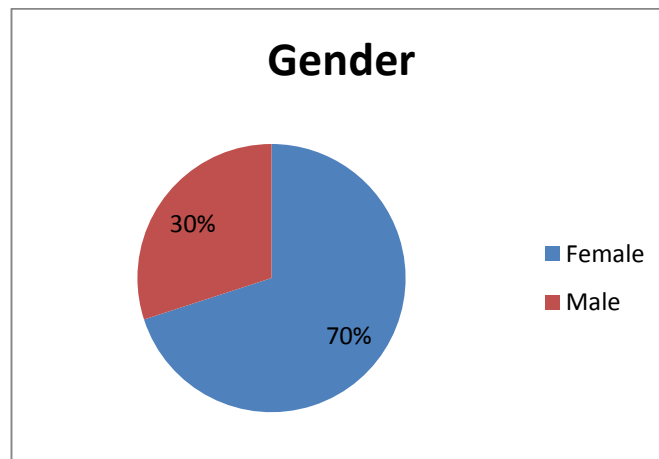


Figure 4.1.1.1 Gender of respondents

There are 40 respondents from the survey which divided by 70% of female and 30% of male.

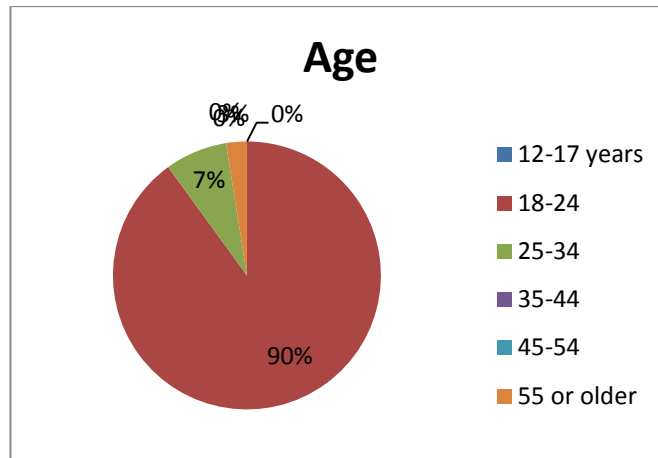


Figure 4.1.1.2 Age of respondents

The age of the respondents in this survey are 90% ranging between 18 to 24 years old, 7% between 25 to 34 years old and 3% is 55 or older.

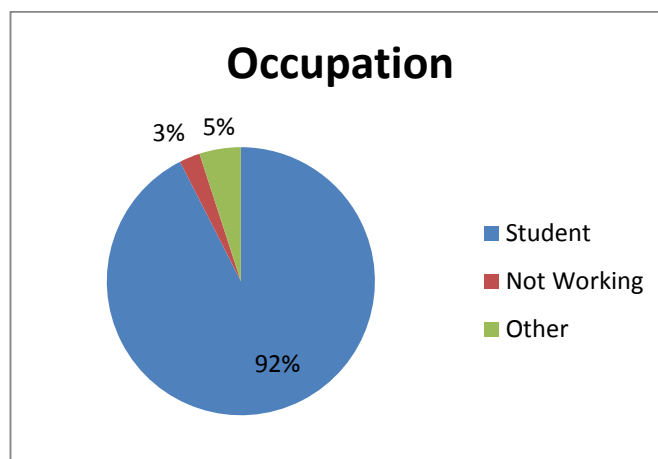


Figure 4.1.1.3 Occupation of respondents

From the chart above, 92% of respondents is student while 5% is working and 3% is not working.

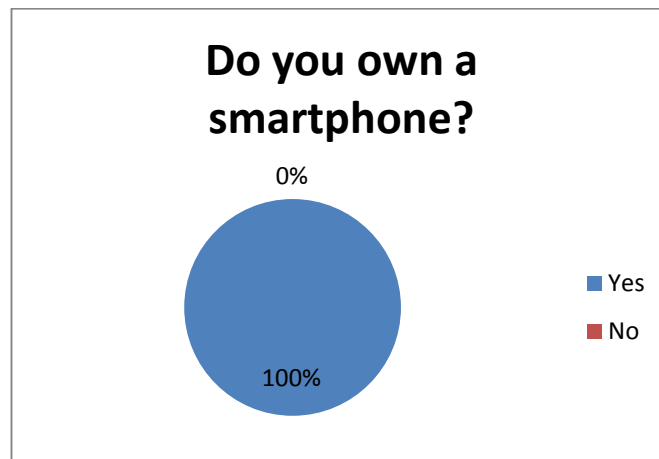


Figure 4.1.1.4 Smartphone user among respondents

All respondents, which is 40 are using a smartphone.

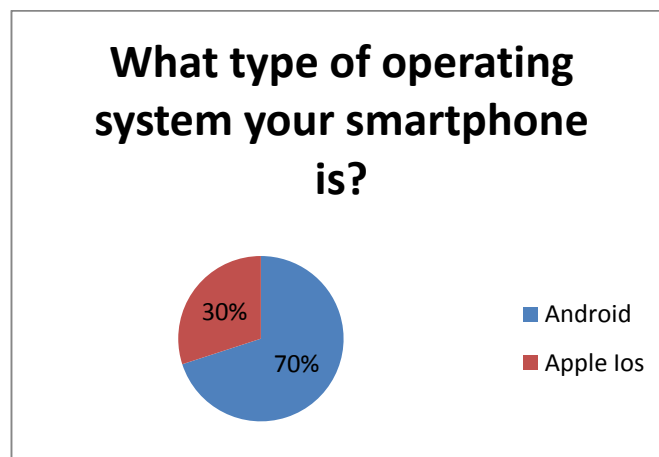


Figure 4.1.1.5 Operating system of smartphone

70% of respondents, majority are using Android platform while 30% are using Apple iOS.

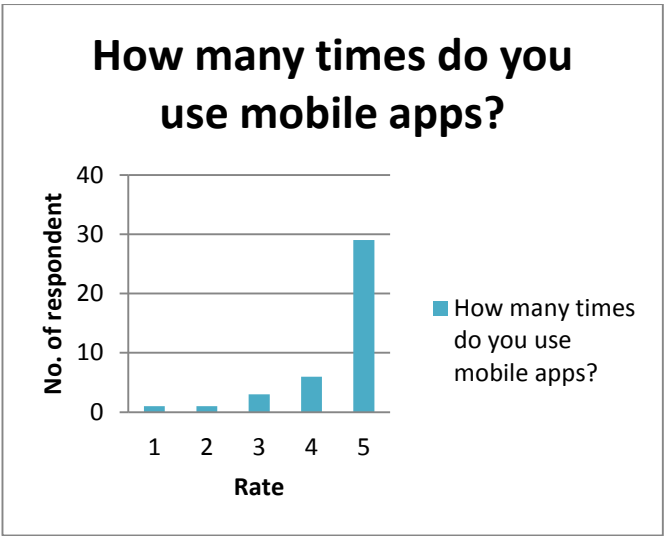


Figure 4.1.1.6 Rate on mobile apps utilization

From the survey, majority of the respondents are frequently using mobile application in everyday live.

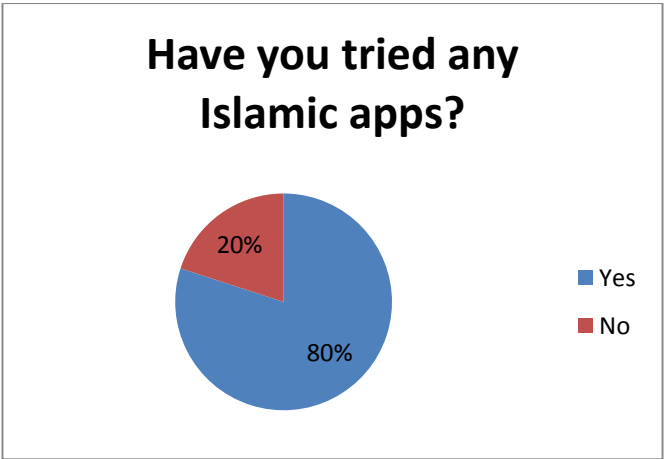


Figure 4.1.1.7 Islamic apps utilization

Majority of the respondents have been tried Islamic apps before while another 20% is a group of people who never used Islamic apps.



Figure 4.1.1.8 Rate on spending for shopping food products

12 out of 40 respondents are likely to spend some time to shop food products in the market. It shows that food is very important towards consumers' everyday live.



Figure 4.1.1.9 Rate on Halal status check by consumers

Majority of respondents are always check on Halal status everytime they buy the food products. This shows that Halal logo is important to consumers to ensure the products they bought does not contain Haram ingredients.

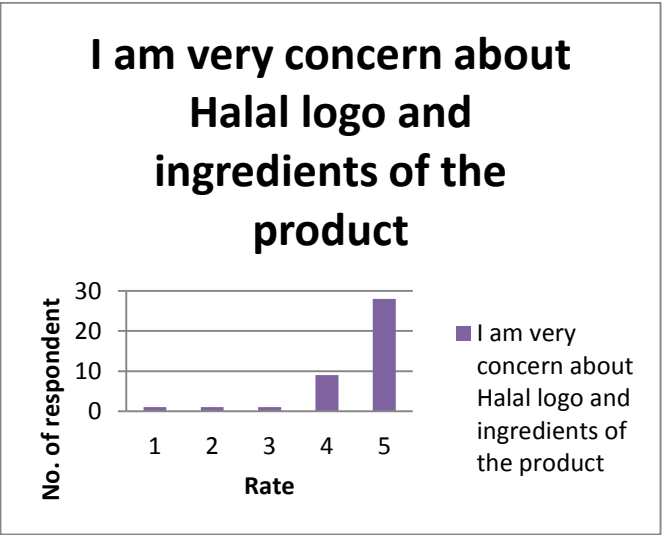


Figure 4.1.1.10 Rate on consumers' concern on Halal logo and ingredients of products

Majority of the respondents are very concern about Halal logo and ingredients of the products. It shows that respondents are dependent on the Halal logo and ingredients of the product in order to buy wisely.



Figure 4.1.1.11 Rate on doubtness of consumers on certain products

15 people is feeling doubt when they shop certain products. This is because, the product does not have Halal logo or the ingredients is from unknown source.



Figure 4.1.1.12 The choice of consumers when shopping food products

The most important thing when respondents about to choose when buying products is Halal status. Secondly, price of the products. Then, quality, brand and good taste.

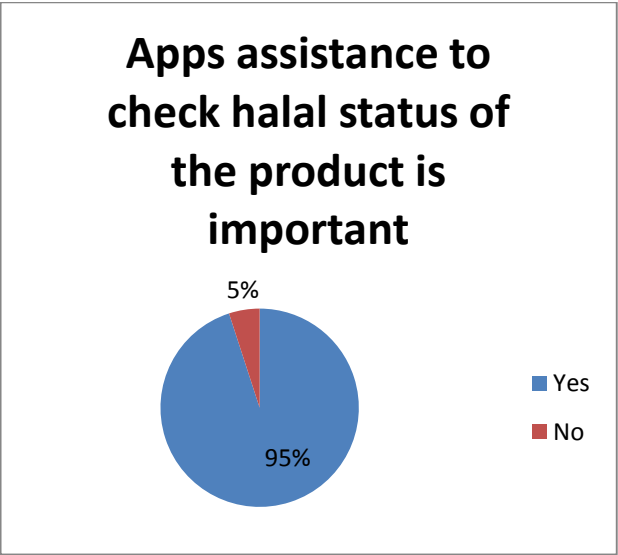


Figure 4.1.1.13 The importance of apps assistance to check Halal status

95% of respondents are agreed that apps assistance to check on Halal status is important while another 5% is not agreed to have apps assistance.

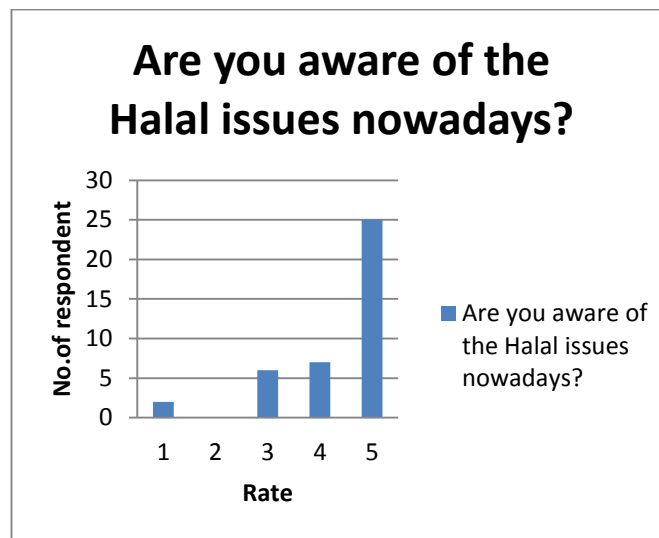


Figure 4.1.1.14 The awareness of consumers on Halal issues

Majority of the respondents are aware of the Halal issues nowadays. This is because, many social networking such as Facebook or Twitter act as an active medium to spread news and reachable to people out there.

4.1.2 Interview

From the interview, there were some questions being addressed and the answers are compiled together to draw the solution to the problems. The interview was done in Friday, 20 of March 2015. The interviewee is 2 person from Halal Development Centre (HDC). The interview was ended about 2 to 3 hours.

Basically, HDC is a government agency which act to improve on the Halal industry globally. HDC is responsible to promote the Halal branding, organized a training, conference and so on to get the Halal certificates and also to suggest on facilities and place to sell the products. HDC is not collaborating with JAKIM but they work together in the same industry as their mission is same which to work on improving Halal industry.

HDC has implemented an application on mobile phone such as Android, Blackberry, Apple iOS and also Nokia. The application is free for user and HDC does not get any profit from the application. I-KIOSK is another physical application which is available at certain supermarket which also to check the Halal status of products.

Furthermore, HDC organized conference, trade fairs and forum to give awareness to the consumers. Besides, road shows and campaigns were organized to reach out the business and consumers which contributing to the Halal industry. The activities that being conducted such as Halfest, World Halal Conference, Halal Internal Auditing Workshop, Best Halal Practice in the Food Industry, SME Mentoring Programme and so on.

Futher discussion, there is law that prevent the forgery of Halal logo. It is under Ministry of Domestic Trade and Consumers Affairs or KPDNKK to investigate the report from public either through JAKIM or KPDNKK itself. The manufacturer shall be fine up to RM 1 million if guilty. Besides, HDC does not really promote Halal products. HDC is promoting the branding of Halal Malaysia to the global level.

Moreover, there are products from oversea such as Korea, Japan and many more. These products are certified by authorization body of Halal product certification and using their Halal logo. When it is imported to Malaysia, it is using Halal logo of their country and consumers need to ensure that products is certified by JAKIM.

HDC does not have any database but the database is only come from JAKIM as it is responsibility of JAKIM to update the Halal certification of the products. The database will be updated once in a 2 weeks while Halal certification will be expired in 2 years duration and company must make sure to renew their certification.

Moving on to deeper discssion, E-numbering system is indicating the ingredients of the products. This number either represent the Halal, Haram or Mushbooh of the status of the products. Mushbooh is either from animal or plant source. The animal source is either from properly slaughtered animal or improper slaughtered animal or pig as well as dog which are obviously Haram and cannot be consumed by consumers.

4.2 Reflection

As data have been analyzed, the storyboard of the application was sketched to view the flow of Halal Checker apps. The user can choose either to scan the barcode or enter the barcode of the products or select manufacturer name in order to check the status of the products.

The scanner and barcode key-in will retrieve the status of the products. This also checks the ingredients of the products. If happened the products is not Halal, but have a Halal logo in it, the consumer can report it to the KPDNKK to investigate the products status by press the report button. Besides, consumers also can share the information through social media such as Facebook, Twitter or E-mail. Beforehand, consumers need to login to the social media if they were about to share the information.

Furthermore, this application also can retrieve the information regarding E-numbering system. To the extend of it, this application will give information regarding the ingredients of the products. Below figures graphically present the functionalities of the application.

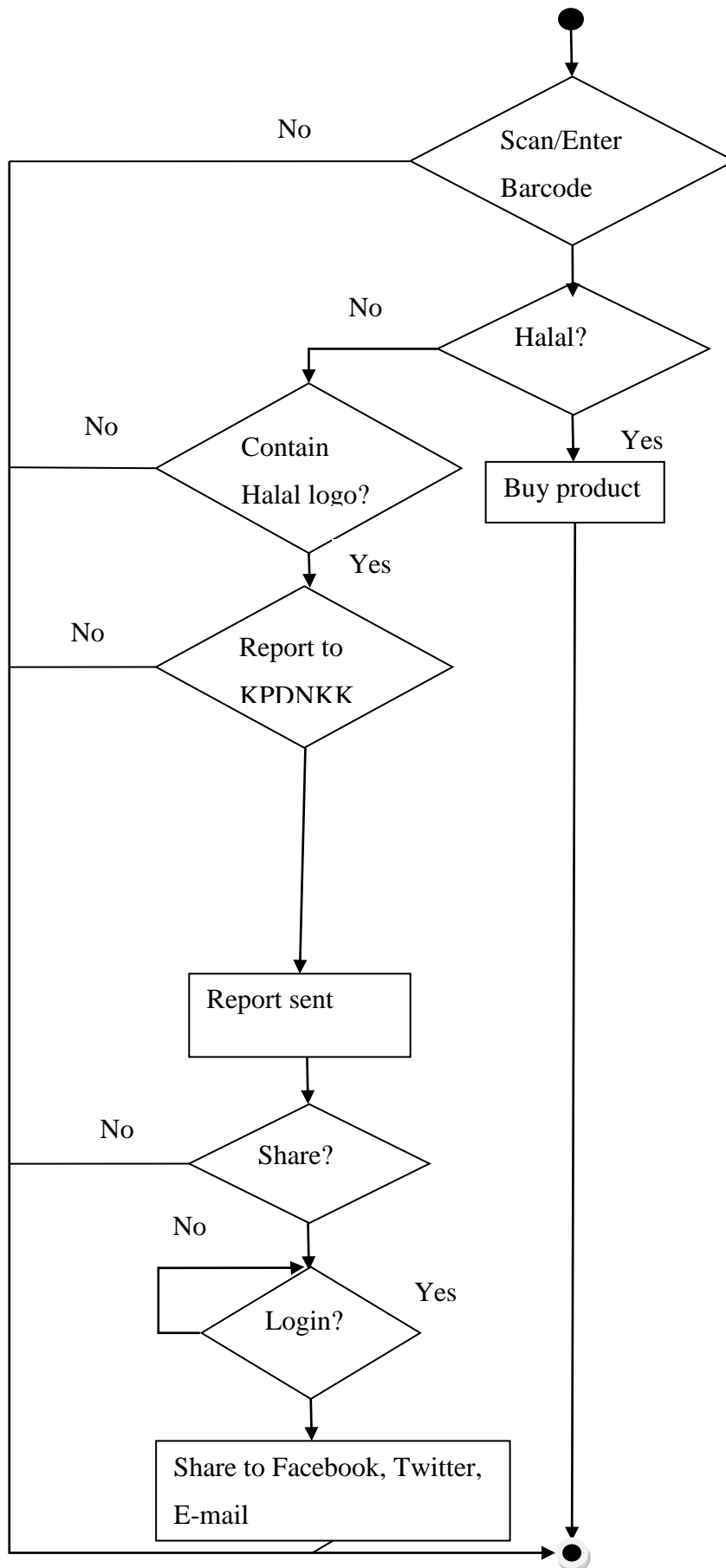


Figure 4.2.1 Activity Diagram on entering barcode

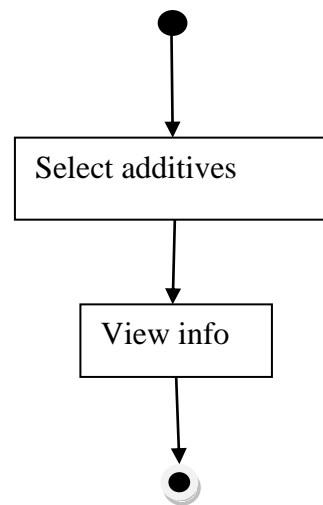


Figure 4.2.2 Activity Diagram on selecting additives

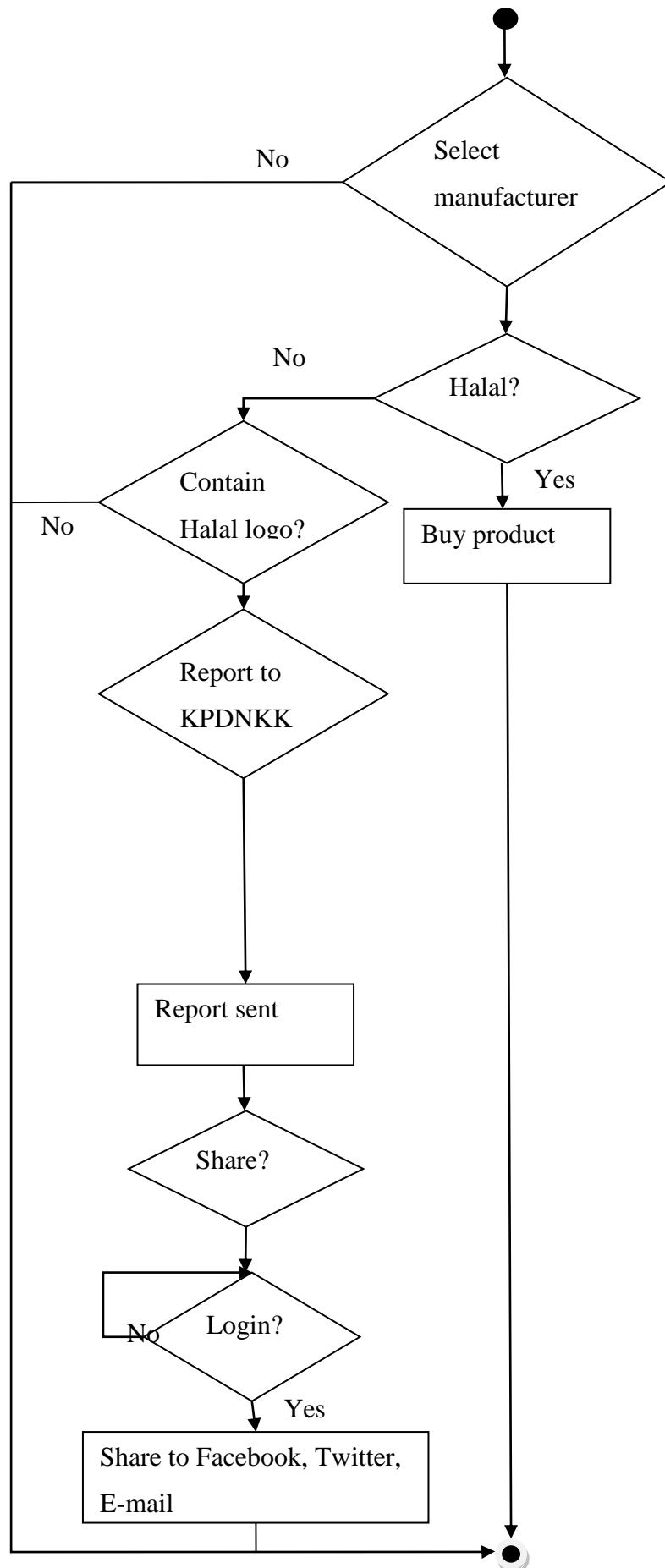


Figure 4.2.3 Activity Diagram on selecting manufacturer name

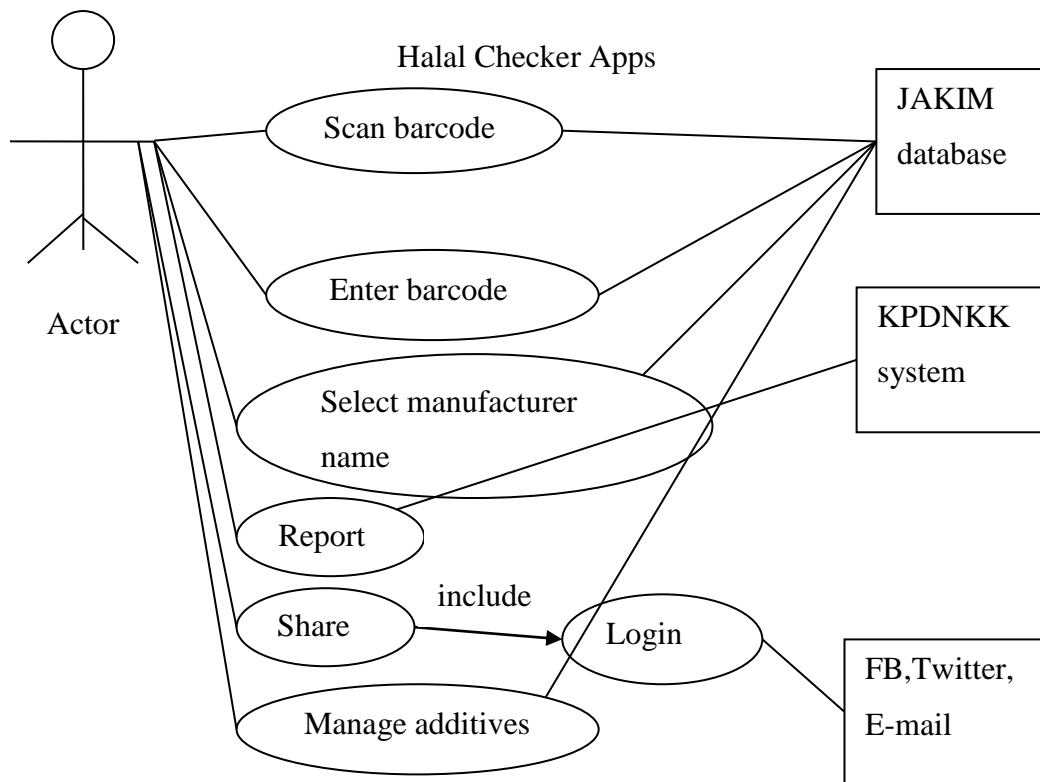


Figure 4.2.4 Use Case Diagram

The figure below shows the application interfaces which consist of six main interfaces. The first interface will be connected to scan, enter barcode, select manufacturer and additives page. For scan and enter barcode page, there will be share and report buttons which are to enable consumers to share on social media and to report to KPDNKK's website.



Figure 4.2.5 Halal Checker Apps interfaces

The functionality testing has been done by the developer during user acceptance testing. It is to record the result of each working functionality in the application. All functionalities are working except for enter barcode which shows that there are two failures. Developer has investigated the root of failures and the codes has been corrected. Below shows the result of functionality testing for 10 Muslim users.

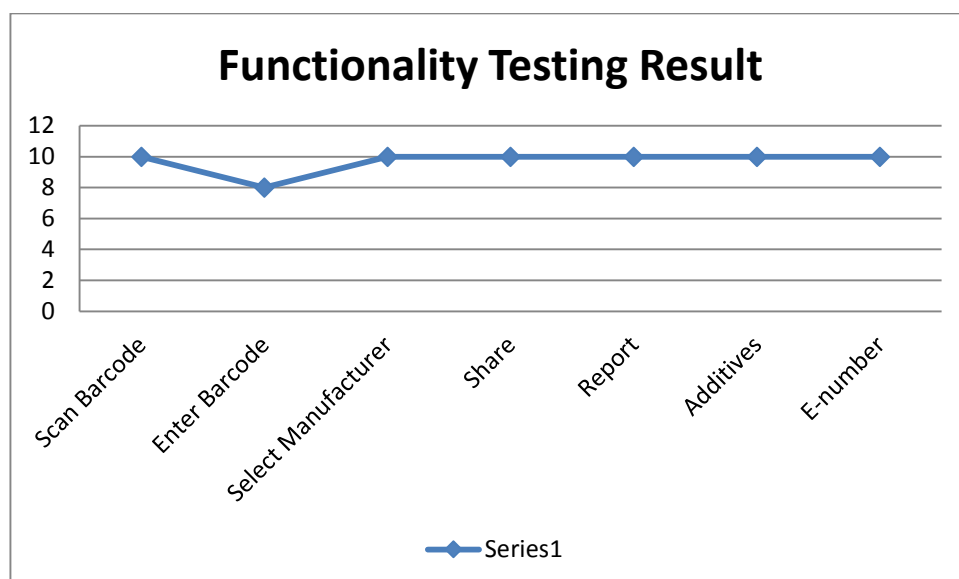


Figure 4.2.6 Functionality Testing

Below are some of pictures taken during user acceptance testing.



Figure 4.2.7 User Acceptance Testing

The figure below shows the result of the survey in the user acceptance testing. Majority of the users are strongly agree that the design of the application interface is nice and not wordy, user can track the status of the products without network connection, user can track the status of the products in an efficient way, user can track the status of the products in an easy way, user can find useful information about the additives and e-number.

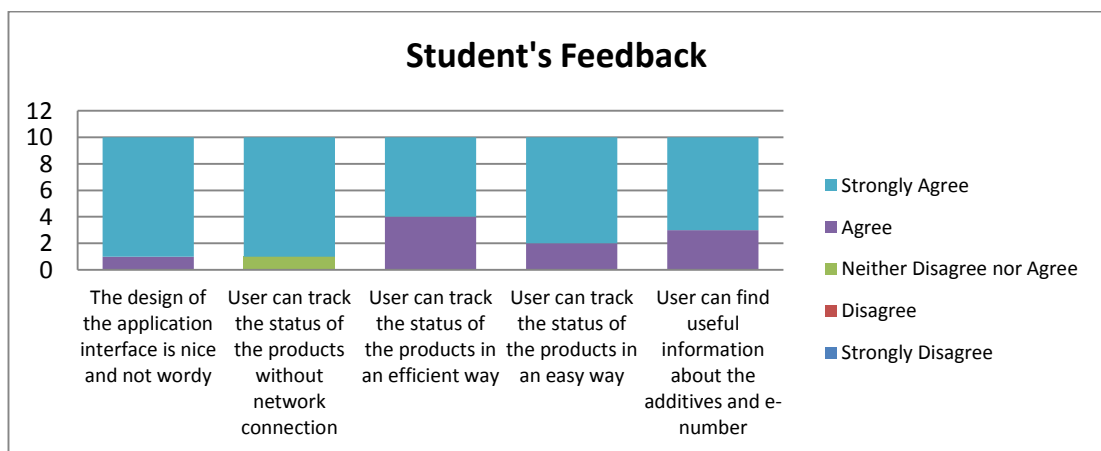


Figure 4.2.8 Student's Feedback on Halal Checker Apps

I did ask the users on their opinion about the Halal Checker Apps either they would like to use it in their everyday live. 70% of the users said yes while the rest are not. One of the reason is they are confident with the Halal logo displayed on the products. Below is the figure for the survey.

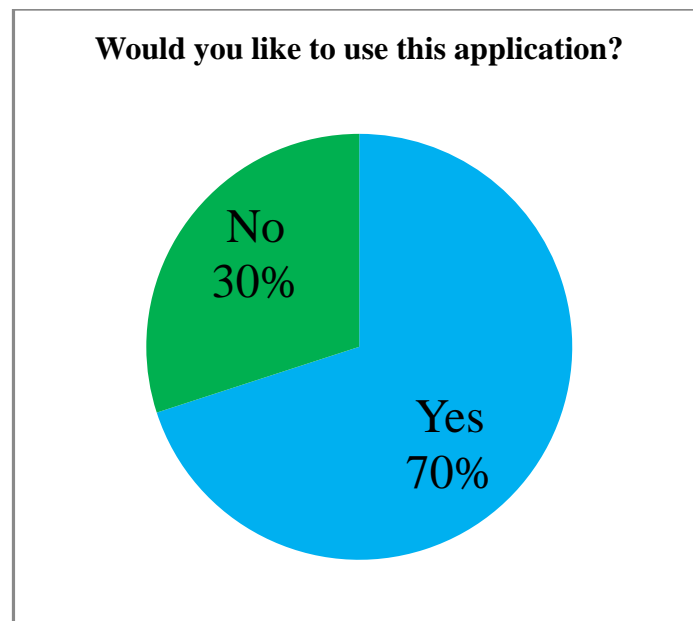


Figure 4.2.9 Student's Feedback on Halal Checker Apps

Last but not least, I also asked their opinion about the Halal Checker Apps. They said it is easy to scan Halal food so that people would not hesitate to buy especially Muslims. They also suggested by improving the database or collaborate with responsible agencies would make this app wearable and use worldwide. Futhermore, it is tally with user's demand. Plus, it is easy to use and mobile friendly.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

In conclusion, Halal Checker Apps has been developed to assist the Muslim consumers while shopping for food products as Muslim consumers are really concern towards Halal status of the food they consume. They will feel assured by only products whose Halal status is guaranteed by JAKIM (Consumers Association of Penang, 2006). *“Let man consider his food, how we pour water in showers. Then split the earth in clefts and cause the grain to grow therein and grapes and green fodder and olive trees and palm trees and garden closes of thick foliage and fruits and grasses: Provision for you and your cattle.”*(Abbasa:24-32).

From the verse, Allah swt has clearly stated that He provided man with all kinds of food. After all, foods that are natural are Halal and pure to eat. In other words, modern foods that have been processed contain all kinds of substances that are doubtful or Haram.

Ultimately, Muslim consumers should think wisely while buying products whose the status is doubtful. By using Halal Checker Apps, it hoped to give an awareness and better understanding as well as guidance to the consumers. Therefore, ways provided in this paper should be utilized by consumers hence they can adopt a healthy life. Moreover, JAKIM must act aggressively by introducing laws to punish the manufacturer or company who done forgery in Halal logo. By a new act, hope it will help to ensure the manufacturer act more responsibly in labelling food products as Halal.

5.2 Recommendations

Final Year Project has given much advantages and benefits to students of Universiti Teknologi PETRONAS as it exposed the students to the real project research. This course indeed had developed the skills of the students such as soft skills and technical skills. In other words, Final Year Project creates a platform for the students to enhance their knowledge and skills in order to be successful in all aspects. My recommendation for this Final Year Project is that the extended functionalities of the Halal Checker apps can be developed according to the consumers' needs. Moreover, Halal Checker apps can be developed on various platform such as iOS. Last but not least, the food database can be improved in order to track the status of the products.

REFERENCES

- Al-Arab, Z. E., Gadallah, A. M., & Hefny, H. M. (2014). An Enhanced Fuzzy Information Retrieval Model based on Linguistics. *Applied Mechanics and Materials*, 519, 853–856. doi:10.4028/www.scientific.net/AMM.519-520.853
- Ambali, A. R., & Bakar, A. N. (2014). People's Awareness on Halal Foods and Products: Potential Issues for Policy-makers. *Procedia - Social and Behavioral Sciences*, 121(September 2012), 3–25. doi:10.1016/j.sbspro.2014.01.1104
- Ariff, M. M. (2015, June 7). *Consumers Need More Info On Halal Issues - Part 2/5 (B)*. Retrieved from DagangHalal.com: <http://www.daganghalal.com/HalalInfo/HalalArticlesDtl.aspx?id=239>
- Bellman, S., Potter, R. F., Treleaven-Hassard, S., Robinson, J. a., & Varan, D. (2011). The Effectiveness of Branded Mobile Phone Apps. *Journal of Interactive Marketing*, 25(4), 191–200. doi:10.1016/j.intmar.2011.06.001
- Bernama. (2014). *Jakim: Products used fake Halal logo*. Kuala Lumpur: Bernama.
- Bernama. (2015). *Need for uniform halal standard in the market*. The Star.
- Consumers Association of Penang. (2006). *Halal Haram A Guide by Consumers Association of Penang*. Pulau Pinang: Consumers Association of Penang.
- Farahnak, A. R. (2015). *Halal Check*. Retrieved March 2015, from <https://play.google.com/store/apps/details?id=com.islam.halalcheck>
- Google Play. (2015, March). Retrieved from <https://play.google.com/store/apps/details?id=org.hc&hl=en>
- Gossen, T., & Nürnberger, A. (2013). Specifics of information retrieval for young users: A survey. *Information Processing and Management*, 49(4), 739–756. doi:10.1016/j.ipm.2012.12.006

Halim, M. 'Afifi B. A., Mohd, K. W. B., Salleh, M. M. M., Yalawae, A., Omar, T. S. M. N. S., Ahmad, A., ... Kashim, M. I. A. B. M. (2014). Consumer Protection of Halal Products in Malaysia: A Literature Highlight. *Procedia - Social and Behavioral Sciences*, 121(September 2012), 68–78. doi:10.1016/j.sbspro.2014.01.1109

Hussain, N. A. (2014). *Fake Halal cert syndicate found*. Petaling Jaya: The Star.

Khalek, A. A. (2014). Young Consumers' Attitude towards Halal Food Outlets and JAKIM's Halal Certification in Malaysia. *Procedia - Social and Behavioral Sciences*, 121(September 2012), 26–34. doi:10.1016/j.sbspro.2014.01.1105

Mitra, M. (n.d.). Information Retrieval : Models , Techniques , and Evaluation.

(n.d.). Retrieved from Importance of Halal:
<http://www.halalhmc.org/ImportanceOfHalal.htm>

Perez, S. (2014, October 3). *Roughly Half of Users Are Finding Apps Via App Store Search,Says Study*. Retrieved from
<http://techcrunch.com/2014/10/03/roughly-half-of-users-are-finding-apps-via-app-store-search-says-study/#comments>

Pixzr. (2010). *Halal e-Codes*. Retrieved March 2015, from
<https://play.google.com/store/apps/details?id=asif.android.app.halalecodes&hl=en>

Said, M., Hassan, F., Musa, R., & Rahman, N. a. (2014). Assessing Consumers' Perception, Knowledge and Religiosity on Malaysia's Halal Food Products. *Procedia - Social and Behavioral Sciences*, 130, 120–128. doi:10.1016/j.sbspro.2014.04.015

Smart&geek. (2015). *Just Halal*. Retrieved March 2015, from
<https://play.google.com/store/apps/developer?id=Just+Halal&hl=en>

The Rakyat Post. (2015). *50 firms using fake halal logos*. Kuala Lumpur: The Rakyat Post.

(t.t). Retrieved from Importance of Halal:
<http://www.halalhmc.org/ImportanceOfHalal.htm>(n.d.).

Ummah labs. (2015). Scan Halal. ummah labs. Retrieved March 15, 2015, from
<http://www.scanhalal.com/>

University of Tampere. (2011, November 18). *Search Techniques*. Retrieved from
Information Search Process in Humanities:
http://www.uta.fi/kirjasto/en/guides/search_guides/humanika/humanities/basics/techniques/index.html

Waters, K. (2007, February 10). *What is Agile? (10 keys principles of Agile)*.
Didapatkan dari All About Agile: <http://www.allaboutagile.com/what-is-agile-10-key-principles/>

Yunus, N. S. N. M., Rashid, W. E. W., Ariffin, N. M., & Rashid, N. M. (2014). Muslim's Purchase Intention towards Non-Muslim's Halal Packaged Food Manufacturer. *Procedia - Social and Behavioral Sciences*, 130, 145–154. doi:10.1016/j.sbspro.2014.04.018

Zulfakar, M. H., Anuar, M. M., & Talib, M. S. A. (2014). Conceptual Framework on Halal Food Supply Chain Integrity Enhancement. *Procedia - Social and Behavioral Sciences*, 121, 58–67. doi:10.1016/j.sbspro.2014.01.1108

APPENDICES

Appendix 1. Interview Questions

4.1.1 What is HDC and its responsibilities?

4.1.2 What is application available nowadays?

4.1.3 What is program handled by HDC to give awareness to the consumers?

4.1.4 Is there any preventive action for fake Halal logo?

4.1.5 How do you promote Halal product?

4.1.6 Is there any products from oversea?

4.1.7 Is there any food database?

4.1.8 How about E-numbering system?

Appendix 2. Interview letter



6th March 2015

Dear Sir / Madam;

REQUEST FOR INTERVIEW

We are requesting your assistance with a Final Year Project which is on “Halal Checker Apps”. A major part of this study is about gathering of related business flows and processes by **MS. LOBNA SHAHIRAH BINTI MOHD SABIRIN (15971)** (an ICT Final Year Student in UTP), who would requests your assistance in conducting interview to gain all necessary information of business processes that related to her project.

We realize that your time is valuable. The participation of organizations like yours is vital to assist our collective understanding of important and necessary processes and requirements of the project. We will of course share our results and findings with you if required.

We would like to assure you that the information gathered in this interview will be treated as confidential and all information provided will be seen only by the student and her supervisor (named below). No personal / company identifying information will be disclosed to anyone whatsoever.

Your utmost support and cooperation in the project is highly appreciated.

Best Regards,

Aliza Sarlan
Lecturer/FYP Supervisor
Computer & Information Sciences Department
Email: aliza_sarlan@petronas.com.my
Phone (off): 05-3687471

UNIVERSITI TEKNOLOGI PETRONAS
INSTITUTE OF TECHNOLOGY PETRONAS SDN. BHD.
(Company No: 352875U) Wholly-owned subsidiary of PETRONAS

Main Campus : Bandar Seri Iskandar, 31750 Tronoh, Perak Darul Ridzuan, Malaysia. Tel: 605-368 8000 Fax: 605-365 4075
Branch Office : Advanced Technology And Innovation Centre (ATIC), L5-1-2, Enterprise 4, Technology Park Malaysia (TPM),
Lebuhraya Puchong - Sg. Besi, Bukit Jalil, 57000 Kuala Lumpur, Malaysia. Tel: 603-8994 1192 Fax: 603-8994 1193

www.utp.edu.my

Appendix 3. The place for interview



Appendix 4. The Halal products



Appendix 5. The Halal products



Appendix 6. The interviewee from Halal Development Centre



Appendix 7. Survey questions

Halal Checker Apps

Hi, I am currently doing Final Year Project 1 entitled Halal Checker Apps. In my research, it shows that Muslim consumers have been exposed to the various of food products which have been manufactured from many countries including non-Muslim countries. Indeed, Muslim consumers are not aware of the Halal issues, Halal ingredients and Halal status of the products. Therefore, there is a need to develop the Halal Checker Apps on smartphone which is to assist Muslim consumers during shopping for food and beverages products. Hence, your feedback is very important and will be recorded. Thank you for participating in this survey.

*Required

1. What is your gender? *

Mark only one oval.

- ☐ Female
☐ Male

2. What is your age? *

Mark only one oval.

- ☐ 12 to 17
☐ 18 to 24
☐ 25 to 34
☐ 35 to 44
☐ 45 to 54
☐ 55 or older

3. What is your occupation? *

Mark only one oval.

- ☐ Student
☐ Lecturer
☐ Businessman
☐ Food supplier
☐ Not working
☐ Other: _____

4. Do you own a smartphone? *

Mark only one oval.

- ☐ Yes
☐ No

5. What type of operating system your smartphone is? *

Mark only one oval.

- ☐ Android
- ☐ Apple iOS
- ☐ Other: _____

6. How many times do you use mobile apps? *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

7. Have you tried any Islamic apps? *

Mark only one oval.

- ☐ Yes
- ☐ No

8. How many times do you spend for shopping food products? *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

9. I always check the halal status of the product everytime I buy food product *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

10. I am very concern about halal logo and ingredients of the product *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

11. I feel doubt when shop certain products *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

12. What make you choose to buy a certain products (you may choose more than one answer) *

Tick all that apply.

- ☐ Price
- ☐ Halal status
- ☐ Quality
- ☐ Brand
- ☐ Other:

13. Apps assistance to check halal status of the product is important *

Mark only one oval.

- ☐ Yes
- ☐ No

14. Are you aware of the Halal issues nowadays? *

Mark only one oval.

	1	2	3	4	5	
Never	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Always

15. Do you have any other comments, questions, or concerns?
